

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Please amend claim 17.

1. to 13. (Canceled).

14. (Previously Presented) A system for monitoring cellular activity in a cellular specimen that contains a plurality of excitable markers, the system comprising:

a laser microscope that is operative to excite the markers in a region of the specimen, wherein the markers in the region radiate fluorescence as a result;

a tunable filter that is operative to process the fluorescence and to pass a portion of the fluorescence, wherein the portion of the fluorescence is within a wavelength band that depends on the setting of the filter;

a plurality of detectors operative to receive the processed fluorescence and to convert the fluorescence into a corresponding plurality of signals; and

an analyzer that is operative to receive the plurality of signals and to qualitatively and quantitatively identify the contribution to the fluorescence from each of the plurality of different excitable markers, wherein the analyzer is operative to quantitatively determine an intensity contribution to the fluorescence from each of the plurality of different excitable markers, and wherein the analyzer uses a linear unmixing operation.

15. (Canceled).

16. (Canceled).

17. (Currently Amended) The system of claim [[16]] 14, wherein the analyzer comprises:

a memory operative to store the detected fluorescence;

a processor operative to generate a model fluorescence from a plurality of templates characteristic of a fluorescence spectrum of each of the plurality of different excitable markers, compare the model fluorescence with the stored fluorescence, vary the weights of each of the plurality of templates until the model fluorescence closely matches the stored fluorescence, and determine quantitative information about the intensity contribution to the fluorescence from each of the plurality of different excitable markers based on the weights.

18. (Previously Presented) The system of claim 14, wherein the analyzer uses a principal component analysis.

19. (Original) The system of claim 14, wherein the tunable filter comprises a liquid crystal tunable filter.

20. (Original) The system of claim 14, wherein the tunable filter comprises an acousto-optical tunable filter.

21. (Previously Presented) The system of claim 14, wherein the plurality of detectors comprises a plurality of photomultiplier tubes.

22. (Previously Presented) The system of claim 14, wherein the plurality of detectors comprises a plurality of high-gain photomultiplier tubes.

23. (Original) The system of claim 14, wherein the laser microscope comprises a multi-photon laser microscope.

24. (Previously Presented) The system of claim 14, further comprising a collector that at least substantially envelops the specimen to receive fluorescence from the markers.

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25. (Original) The system of claim 24, wherein the collector comprises an integrating sphere.

26. (Canceled).

27. (Canceled).

28. (Canceled).

29. (Previously Presented) The system of claim 14, wherein the laser microscope is a laser scanning microscope.